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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,021	04/15/2004	Shannon V. Davidson	064747.1017	7500
45507	7590	05/07/2007		
BAKER BOTTS LLP 2001 ROSS AVENUE 6TH FLOOR DALLAS, TX 75201-2980			EXAMINER VO, TED T	
			ART UNIT 2191	PAPER NUMBER
			NOTIFICATION DATE 05/07/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

Application No.

10/825,021

Applicant(s)

DAVIDSON ET AL.

Examiner

Ted T. Vo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 14 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/15/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

4/15/04, 8/1/05, 8/15/05, 10/10/05, 3/8/06, 5/8/06, 6/14/06  
10/13/06, 11/13/06, 12/29/06, 3/2/07, 3/26/07

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
- Paper No(s)/Mail Date See

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This action is in response to the communication filed on 04/15/2004.

Claims 1-24 are pending in the application.

#### ***Information Disclosure Statement***

2. The filed information disclosure statements have been acknowledged.

A considered reference/information listed in a patent when it is issued must be pursuant to 37 CFR 1.98(b); particularly, for a reference, listed in Non Patent Literature Documents, it must submit a copy and must be identified by publisher, author (if any), title, relevant pages of the publication, date, and place of publication. If a reference that does not meet the requirement under 1.98(b), it will result in being strikethrough.

#### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-30 recite the limitations that are not consistent to the specification. For example,

Claims 1-8: A limitation in a claim when first appeared, it sets the antecedent basis or display

functionality in the claim. A limitation that is for attempting with appearance only and does not do anything or does not know what it does in the claim will fail to particularly point out and distinctly claim the subject

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matter. Accordingly, a claim that recites a limitation in this manner is indefinite. The claims 1-8 recite, "comprising an integrated fabric". This limitation causes the claim to be ambiguous.

Furthermore, In a patent infringement test, a limitation requires a physical meaning so that it can be set up for the test and also can be particularly pointing out a subject mater of a claim. The term used "determining an unallocated subset from a plurality of HPC nodes" is ambiguous because it mentally indicates an aspect rather physically points out a subject mater. It should be noted that before an allocation, every element is unallocated, therefore saying "determining an unallocated subset from a plurality of HPC nodes" is a mere mental indication, and it does not know whether an existed element according to the claims is allocated or unallocated. It does not know an actual boundary in claiming. For example, a set {a,b,c,d,e} is allocated. However before the allocation, a subset such as {a}, {e}, or {d,e}, or any, is unallocated. Therefore the meaning of "determining in "unallocated subset" is unclear.

The claim that recites unclearly functionality is indefinite.

The interpretation for "*determining an unallocated subset from a plurality of HPC nodes*" and "*executing the selected job using at least a portion of the unallocated subset of nodes*", is as an execution of a job queue such as {a,b,c,d,e} which is allocated.

Claims 9-24 appear reciting in the similar manner of claims 1-8.

The claims 1-24 thus are indefinite as addressed above.

#### ***Claim Rejections - 35 USC § 101***

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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6. The claims 9-24 are rejected under 35 U.S.C 101 because the claimed invention is directed to non-statutory subject matter.

A claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible" result. State Street, 149 F.3d at 1373, 47 USPQ2d at 1601-02.

As per Claims 9-16: Claims 9-16 recites software. The claims do not meet the statutory requirement because the claims are programming per se.

As per Claims 17-24: Claims 17-24 recites *a system for job management*, where "system" is generic. The claims are generally associated with an "*HPC environment*", where environment is generic.

With the limitation,

*a plurality of HPC nodes, each node including an integrated fabric;*

*and a management node operable to: determine an unallocated subset from the plurality of HPC nodes; select an HPC job from a job queue; and execute the selected job using at least a portion of the unallocated subset of nodes.*

It is merely to recite the two nodes. The term "*operable to*" is intended to the ability of the management node that fails to be connecting the two nodes in a tangible system. The Claims thus merely recite a data structural per se.

#### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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8. Claims 1-24 are rejected under 35 U.S.C. 102(a) as being anticipated by Hovestadt, Axel Keller and et al., "Scheduling in HPC Resource Management Systems: Queuing vs. Planning", Proceedings of the 9<sup>th</sup> Workshop on Job Scheduling Strategies for Parallel Processing, Seattle, WA, pages: 1-19, 6-2003 (hereinafter: Keller).

Given the broadest reasonable interpretation of followed claims in light of the specification.

As per Claim 1: Keller discloses,

***A method for job management in an HPC environment (p.6, Fig. 2) comprising:***

***determining an unallocated subset from a plurality of HPC nodes, each of the unallocated HPC nodes comprising an integrated fabric*** (p.6, "an ability to co-allocated resources" (i.e. allocated several different resources in a queue for execution) (note: see p. 15, last paragraph, refer to N nodes that are not allocatable when a user request for more then T nodes). Also see p. 16, sec. 4.4 refer: "dependency graph": *subset of HPC nodes*, refer: hypernodes: *unallocated subset*);

***selecting an HPC job from a job queue*** (i.e. an execution is selected on a job queue); ***and executing the selected job using at least a portion of the unallocated subset of nodes*** (See p. 16, the grouping of different dependency graphs in the HPC scheduling – the ability of nodes being interconnected by edge via communication endpoints).

As per Claim 2: Keller discloses, *The method of claim 1, wherein selecting the HPC job comprises selecting the HPC job from the job queue based on priority* (See p. 3: sec. 2.1 Queuing Systems: queue priority), *the selected job comprising dimensions not greater than a topology of the unallocated subset* (See p. 15, last paragraphs: refer to Threshold, and N nodes are not allocatable).

As per Claim 3: Keller discloses, *The method of claim 2, wherein selecting the HPC job from the job queue based on priority comprises: sorting the job queue based on job priority* (p. 3, sec. 2.1); *selecting a first HPC job from the sorted job queue* (p. 3, sec. 2.1); *determining dimensions* (i.e. Network topology, or see Fig. 1 the axis of Available resources) *of the first HPC job with the topology of the unallocated subset* (p. 14, in Mapping, see "static" and dynamic", and p. 15: "N"); *and in response to the dimensions of the first HPC job being greater than the topology of the unallocated subset* (See Fig. 1 and p. 15: "system

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wide node limit”), *selecting a second HPC job from the sorted job queue* (i.e. ability of the queue systems for using free resources with waiting resource requests (in p. 3), ability of co-allocation, of grouping different dependency graphs of the queue system and planning (sec. 2.1 and 2.2)).

As per Claim 4: Keller discloses, *The method of claim 2, wherein the dimensions of the first HPC job are based, at least in part, on one or more job parameters and an associated policy* (i.e. resources/against time axis as mentioned in p. 3:1-3).

As per Claim 5: Keller discloses, *The method of claim 2, further comprising: dynamically allocating a job spare from the unallocated subset based, at least in part, on the dimensions of the HPC job; and wherein executing the selected job comprises executing the selected job using the dynamically allocated job spare* (See sec. 3.2, start at p.6, and noted that the queue systems/planning has an ability to allocate job spare as using the free recourses for waiting request resources).

As per Claim 6: Keller discloses, *The method of claim 1, the plurality of HPC nodes comprising a first plurality* ((unclear meaning: and as part of 112 second paragraph in this action: interpreted as a cluster in the HPC system) see node in clusters in p. 1, different dependency graphs, p. 16) *and the method further comprising: determining that dimensions of the selected job are greater than a topology of the first plurality; selecting one or more HPC nodes from a second plurality* (See Fig. 1, and last paragraph in p. 15), *each of the second HPC nodes comprising an integrated fabric; and adding the selected second HPC nodes to the unallocated subset to satisfy the dimensions of the selected job* (See the sec. 2.1 and 2.2).

As per Claim 7: Keller discloses, *The method of claim 6, further comprising returning the second HPC nodes to the second plurality* ((unclear meaning: and as part of 112 second paragraph in this action) see node in clusters in p. 1, different dependency graphs, p. 16, i.e. another job/ node is selected in queuing)

As per Claim 8: Keller discloses, *The method of claim 1, further comprising; determining that a second HPC job that was executing on a second subset in the plurality of HPC nodes has failed* (See last paragraph in p. 15, or the description of System Wide Node Limit (i.e. SWNL), for the case when the user requests a number of nodes  $T+N$  greater than the threshold  $T$ ); *adding the second subset to the*

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*unallocated subset; and adding the failed job to the job queue (the SWNL defines automatically the number N is not allocatable notes).*

As per Claims 9-16: See rationale addressed in the rejection of Claims 1-8, respectively.

As per Claims 17-24: See rationale addressed in the rejection of Claims 1-8, respectively.

### **Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (571) 272-3706. The examiner can normally be reached on 8:00AM to 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wei Y. Zhen can be reached on (571) 272-3708.

The facsimile number for the organization where this application or proceeding is assigned is the Central Facsimile number **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



TTV  
April 27, 2007

**TED VO**  
**PRIMARY EXAMINER**